AMBARINO®
High Class

New
Multi
Colors

It all began with Damping

We didn`t invent
dentures
in Marburg.
Only made the
best of it.

AMBARINO® ***High Class*** – Feel the difference

Benefits	AMBARINO® High Class	Zirconia	Acrylic
Feels like natural teeth	✓	✗	✗
Durable	✓	✓	✗
Light weight	✓	✗	✓
Shock absorption	✓	✗	✓
Adjustable chairside	✓	✗	✓
Stain resistant	✓	✓	✗
Bends under stress	✓	✗	✓
Can drill for endodontics	✓	✗	✓
No sintering required	✓	✗	✗
Ideal for bruxism	✓	✗	✗
Ideal for implants	✓	✗	✗
Easily bonded	✓	✗	✓

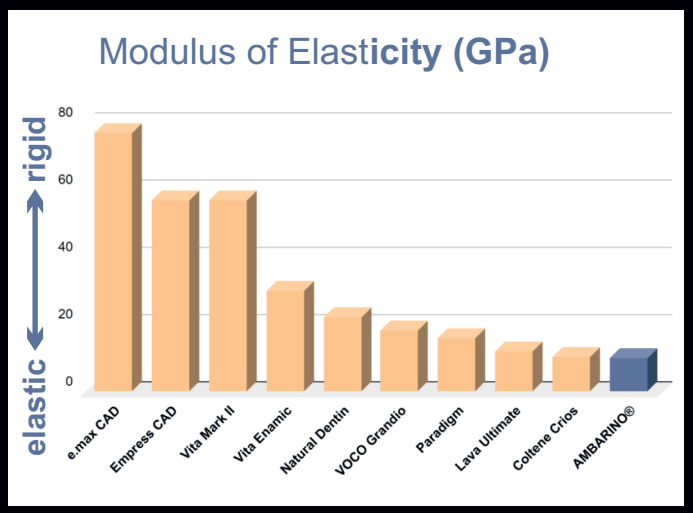
AMBARINO®
High Class

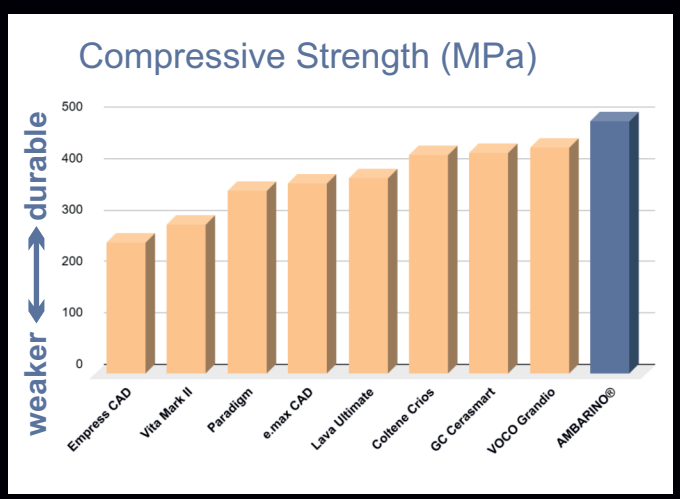
Zirconia

AMBARINO® ***High Class*** is More Elastic

Modulus of Elasticity indicates whether the material will dampen the effects of chewing, allowing the restoration to flex and give under pressure, which reduces fractures and chips over time on all types of restorations.

AMBARINO® ***High Class*** is more elastic compared to other modern millable dental ceramics and hybrids. Additionally, because an implant patient doesn't have the feedback mechanism and shock absorbing features of a periodontal ligament to rely on, elasticity of the restoration can also crucially reduce the transfer of energy to the underlying implants and bone structure.





AMBARINO® ***High Class*** is More Durable

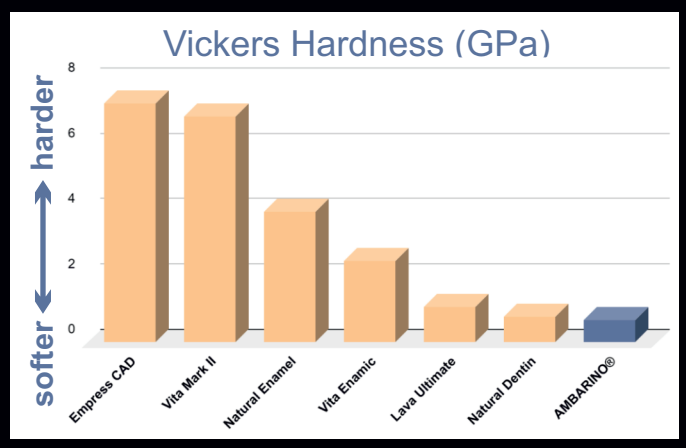
Compressive strength estimates the durability of a material when supported underneath by an implant or tooth structure, used to determine how a restoration will perform long term under tensile and shearing forces while clenching or chewing.

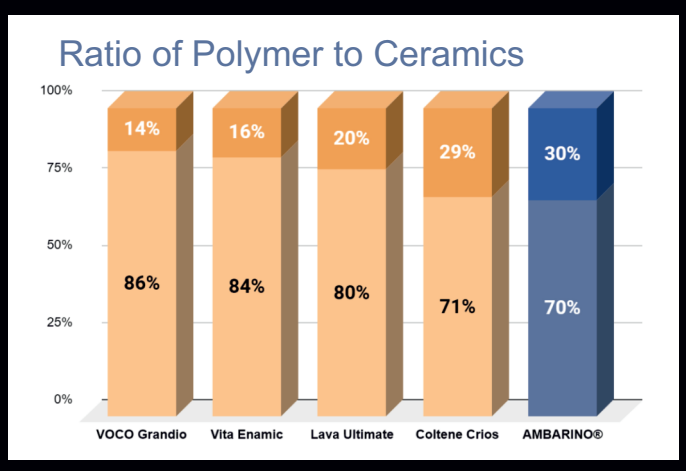
AMBARINO® ***High Class*** is a more durable material compared to other ceramics, composites and hybrid materials. Mastication tests, simulating 1.2 million chewing cycles, illustrate that the material will wear well long term without fracturing or chipping.

AMBARINO® ***High Class*** is Less Brittle

Vickers hardness illustrates how hard or brittle a dental material is compared to natural tooth structures. Ceramics are harder than enamel, which sometimes results in an undesireable clacking or chopping sound and feeling when biting or chewing.

AMBARINO® ***High Class*** is softer than natural dentin and other milled hybrid and ceramic dental materials, making the restorations more pliable, gentle and forgiving, both feeling better and sounding better for a high quality patient experience.



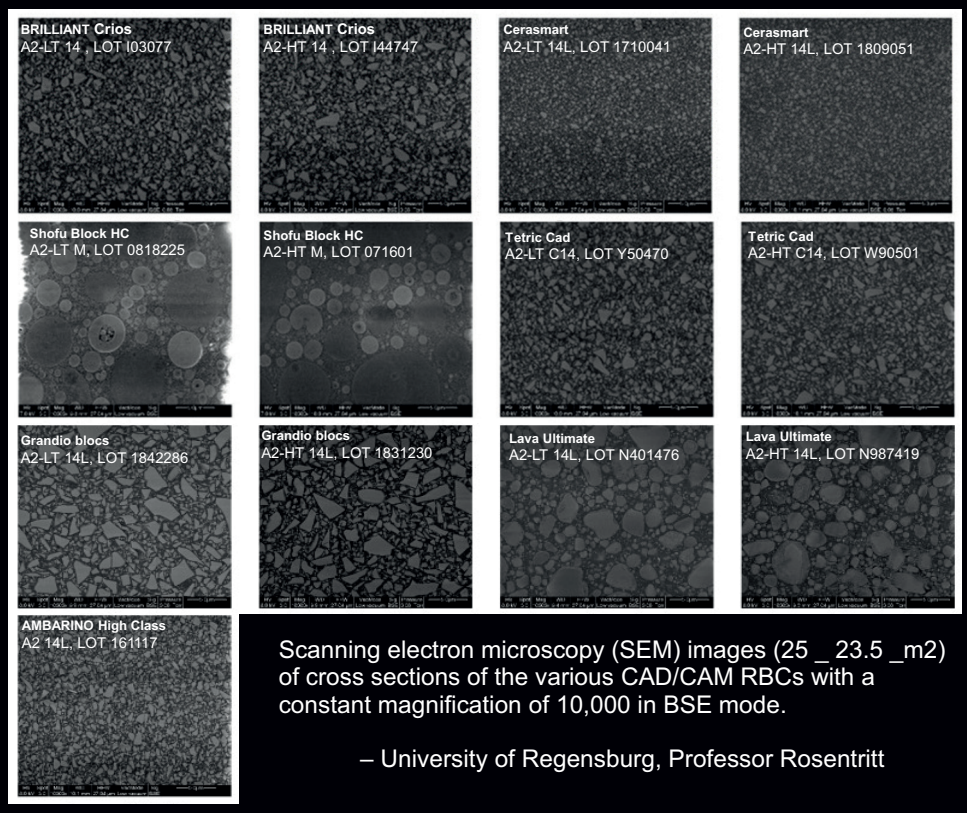


AMBARINO® ***High Class*** is a Perfect Blend

The challenge of developing a perfect hybrid dental material is to find that goldilocks zone with the most ideal combination of mechanical and esthetic characteristics from the blended materials.

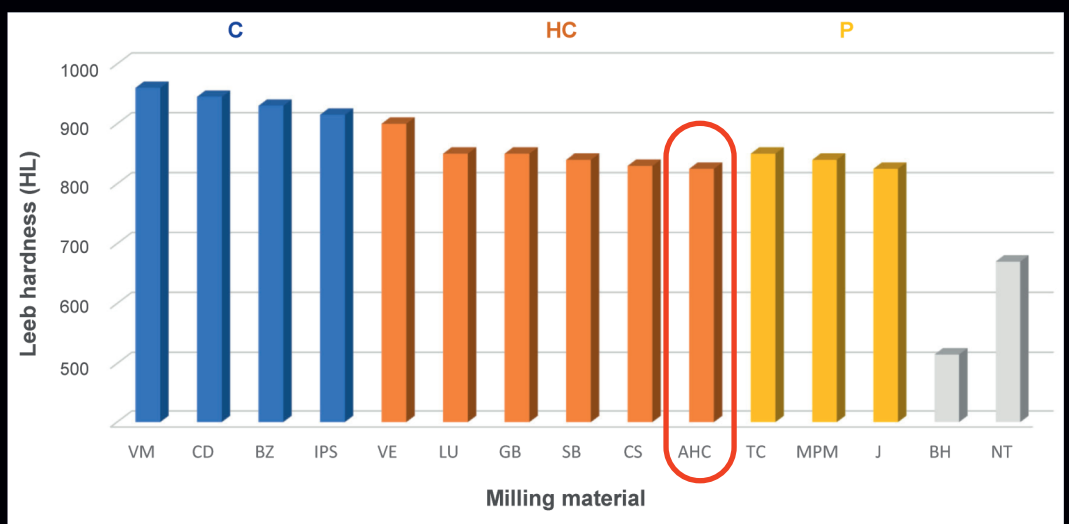
AMBARINO® ***High Class*** is manufactured in a proprietary process using the most modern polymers and aesthetic glass filler materials available. The higher polymer content results in restorations that are more durable and elastic compared to other hybrids, making them particularly ideal for implant cases.

AMBARINO®
High Class
gets its strength and beauty from the even distribution of its glass and polymer blend.



Scanning electron microscopy (SEM) images (25 _ 23.5 _m2) of cross sections of the various CAD/CAM RBCs with a constant magnification of 10,000 in BSE mode.

– University of Regensburg, Professor Rosentritt



AMBARINO®
High Class
isn't as hard as dental ceramics and polymers, or any of the other hybrids.

This makes it easier to mill and illustrates the damping effect, which feels closer to natural teeth than other restorative materials.

This creates a shock absorbing characteristic that makes the material ideal for crowns or arches over implants.

Milling Material		Manufacturer	Lot	Shade	Material Type	
Vitabloc Mark II	(VM)	Vita Zahnfabrik	37480	A2C	Feldspathic Ceramic	C
Celtra Duo	(CD)	Dentsply Sirona	18025791	A2 LT	Lithium disilicate glass ceramic	C
BruxZir	(BZ)	Glidewell	BZ00101 86	A2	Zirconia	C
IPS e.max CAD	(IPS)	Ivoclar Vivadent	W05269	A2 HT	Lithium disilicate glass ceramic	C
Vita Enamic	(VE)	Vita Zahnfabrik	38910	2M2HT	Hybrid Composite	HC
Lava Ultimate	(LU)	3M ESPE	N880844	A2 LT	Hybrid Composite	HC
Grandio blocs	(GB)	VOCO	1715234	A3 HT	Hybrid Composite	HC
Shofu Block	(SB)	SHOFU Dental	021501	A2 LT	Hybrid Composite	HC
Cerasmart	(CS)	GC Group	1512021	A3 HT	Hybrid Composite	HC
Ambarino High -Class	(AHC)	Creamed	160117	A2	Hybrid Composite	HC
Telio CAD	(TC)	Ivoclar Vivadent	23170	1M2T	Polymethyl - methacrylate	P
M-PM disc	(MPM)	Merz Dental	31231	A2	Polymethyl - methacrylate	P
Juvora PEEK Optima	(J)	Juvora Ltd	J000025	——	Polyetheretherketone	P
Bio Herador N	(BH)	Kulzer	36513	——	Gold alloy #	—
Natural Tooth	(NT)	Human Third Molar	——	——	Wet Enamel	—

Tab 1 Investigated CAD/CAM materials. # (Au: 86.2 %, Pt: 11.5 %, Zn: 1.5 %)
C, ceramic; HC, hybrid composite; P, polymeric resin.

Simply practical - everyday dental materials
Implantology - it all began with damping

In this essay I would like to make reference to the very interesting, below-mentioned article, which appeared in Science Direct, published by Elsevier:

New method to differentiate surface damping behavior and stress absorption capacities of common CAD/CAM restorative materials

Th.Niem, S.Gonschorek, B.Wöstmann Department of Prosthodontics, Justus-Liebig-University Gießen

Dental Materials, Volume 37, Issue 4, April 2021, Pages e213-e230

This study does not need to be scientifically examined again at this point. It is also not my specialist area. Instead I would like to invite the reader to consider the insights gained in the study regarding the damping behaviour of different dental materials in the context of denture construction, which by now is state-of-the-art.

Table 1–Tested materials.

Materialtype	Brand	Code	Manufacturer	Lot no.[d]
Ceramic	CerecBlocsS3PC	CB	DentsplySirona	39090(b)
	CeltraDuoHTA2non-crystallized	CD-nc	DentsplySirona	V18025791(b)
	CeltraDuoHTA2crystallized	CD-c	DentsplySirona	V18025791(b)
	CeltraPressHTA2	CP	DentsplySirona	16003789(ps)
	IPSe.max CAD HTA2non-crystallized	IPS-nc	IvoclarVivadent AG	W05269(b)
	IPSe.max CAD HTA2crystallized	IPS-c	IvoclarVivadent AG	W05269(b)
	IPSe.maxPress LT A2	IPSP	IvoclarVivadent AG	V15816(ps)
	VITABLOCSMarkII2M2C	VB	VITAZahnfabrik	57000(b)
Composite	AMBARINOHighClassA2	AHC	CreamedGmbH	160117(b)
	BRILLIANTCriosA2HT	BC	ColtèneWhaledent AG	H82105(b)
	CERASMARTA2HT	CS	GCDentalProducts	1512012(b)
	KatanaAvenciaA2 LT	KA	Kuraray NoritakeDental	000368(b)
	Lava UltimateA2HT	LU	3MESPE	N880844(b)
	ShofuBlockHChardA2 LT	SBH	SHOFUInc.	0819912(b)
	Tetric CAD A2MT	TC	IvoclarVivadent AG	Y28172(b)
	VitaEnamic2M2HT	VE	VITAZahnfabrik	56063(b)
Polymer	M-PMDiscA2	MPM	MerzDentalGmbH	10417(d)
	C&BMFHN3	ND	NextDent B.V.	XK205N01(p)
	Telio CAD A3 LT	T	IvoclarVivadent AG	VY0857(b)
	VitaCAD-Temp1M2T	VCT	VITAZahnfabrik	23170(d)
	Alphador No. 1[a]	AD	SchuetzDentalGmbH	19L0500HR(b)
Metal	Starbond Ti4[b]	Ti4	S&SScheftnerGmbH	4021820719(d)
	Starbond Ti5[c]	Ti5	S&SScheftnerGmbH	5024071119(d)
Tooth	Bovineenamel	BE	Mandibularincisor	Cattle

The patient's wish for "white", from posterior to anterior, should and must be taken into consideration. After all, we have sufficient materials available for this.
The research group had the task of investigating whether different, established dental materials are able to absorb chewing force and prevent or alleviate stress situations in the stomatognathic system, on the basis of their damping behaviours. In particular in relation to work involving implants, which lack natural absorption mechanisms.
The investigations and assessments were based on two different processes for measuring hardness, which play only a subordinate role, if at all, in the DIN [German Institute for Standardisation] norms for dental materials and are little-known, or not known at all, to users. The first is the Martens hardness test, which tests the plastic-elastic behaviour of a material. A diamond pyramid is pus hed into a sample material to calculate the contact area based on the depth of indentation at maximum force. This test can be compared with the isometric clenching

For the second measurement method, the Leeb rebound hardness test was used, a dynamic testing procedure. At a speed of 2.1 m/sec, a testing sample is hit against the surface of the material. The collision of the impact body causes a deformation of the surface, which leads to a loss in kinetic energy. This loss of energy is determined by measuring the speed, and a resulting hardness value, HL, is calculated. Therefore energy, from static to kinetic, was introduced to the material, just like in situ in the mouth.
Now we know the law of conservation of energy, which states that energy cannot be lost in a closed system. This also applies to dentures. In our case, the question now is: Where is the introduced energy channelled to?
More on that later.

The heart of the issue relates to bionics.

Bionics is based on the assumption that living nature develops optimised structures and processes through evolutionary processes, which humans can and must learn from.
Imagine you were in the position to manufacture true replacement teeth. What is that supposed to mean, you ask yourself; I already do that. With all due respect to your and our work, what we do is try to repair and hide missing tooth substance. To imitate the lost status quo using prostheses. In terms of aesthetics, this often works wonderfully, and visually it cannot be differentiated from nature. But, if truth be told, what we do not do is replace nature's brilliant concept of the tooth identically in terms of material and function. In fact, not at all when implants are in the mix.
We know how our teeth and the stomatognathic system work. We also know how materials that are needed for dentures must or should work. So what is stopping us from using such materials? If we have them available.
Then should we also accept the rules of function of such materials? One of these rules is as follows: Function is associated with wear and tear. There are plenty of examples of this in everyday life. For example car tyres, but also our natural teeth, wear out over time.
Is it the case that we do not have the courage or the time to clarify for patients the functional processes in their oral cavity and the paradigms needed for dentures? Because that would mean that we take away from them their delusion that the prosthesis that is inserted (permanent dentures are nothing more than this, after all) will be a tooth replacement that will function over a long period and virtually last forever. This belief that dentures will remain unchanged over many years, and keep the same practical function, would turn the laws and processes of nature on their head and close the matter. Saying to them: "If you want dentures that function the same way as nature then you must be aware that they will wear out, and in fact must wear out." We can face them with something they know: their car. Then they will understand what we mean. There are bald tyres, worn brake pads, smearing wiper blades and shock absorbers. There are services and maintenance intervals, planned repairs (changing the

fan belt, brake pads etc.) and unexpected ones (cylinder head gasket).
It is similar with people, with the difference that they are not nearly as accepting of the inevitable laws of nature as they are for a car.
A very significant interference with the statics, mechanics and optics of our stomatognathic system is the unnoticed loss of the vertical dimension and/or the horizontal shifting and/or the loss of one or maybe even more natural support zones, which takes place gradually over many years.
And at some point this adapted and tolerated system begins to collapse, in particular if the task of teeth replacement has been bodged, with the pervasive "a little something here, and a little something there" — not considered to be a good idea by any expert, and a method which often requires getting rid of everything and reconstructing from scratch.

Replacing a damaged gear with an identical gear in a mechanical system is possible without any problems, since all parameters can be copied exactly. The key word when it comes to the living system of the masticatory organ, however, is "adaption". Other important components of the system are compensation, integration and resilience. Just considering the mechanical, bony and soft-tissue laws that a prosthesis is subject to is not enough. Muscle tone, stress avoidance and the patient's individual wellbeing are equally important.

Implantology – it all began with damping

In 1965 Branemark, who was an orthopaedist, inserted 4 implants in his first patient Mr Larsson, which he had in situ for over forty years (!), up until his death in 2006.
Branemark's second patient, S. Johansson, received 11 implants in the upper and lower jaw in 1967. They were all still in place for 48 years! My information does not go further than that. Mr Johansson turned ninety in 2016!
His prostheses at the time consisted of bridges with a high gold content, veneered with plastic. There was no zirconium dioxide, no lithium disilicate, no milled or printed EMF alloys, and no highly-filled hybrid ceramics/composites. A permanent adaption of the materials to the strains that arose was provided. There were no alterna tives. Plastic veneers had to be regularly replaced, if you did not want to put up with vertical losses and aesthetic degradation.
Unfortunately I do not know whether Mr Johansson had that sort of care all those years, presumably with regular corrections of the veneers, or whether at some point the bridges were replaced with ceramic veneers. At this point you may ask yourself: Which materials would Prof. Branemark use today for Mr Johansson, in light of the experiences he accumulated in the time up until his death in 2014? For both the implants and the superstructures? Would he, perhaps at the request of the patient Johansson, use bridges made out of monolithic zirconium dioxide? What would his prognosis be for the retention time and performance of the whole structure, including the biological one?

Even natural teeth are not the one-size-fits-all solution that many people wish for. Free from wear yet adaptive and functional, highly aesthetic in the light, easy to manage at the dentist's, of course also prospective (key word revision, trepanation etc). But even natural teeth have their limits, and show fissures, chips and abrasions. Dentures are not new teeth, but simply a version of them.

Reflections on the study

The goal of the study was to evaluate the damping behaviours and the stress absorption of different dental materials after the impact of force.

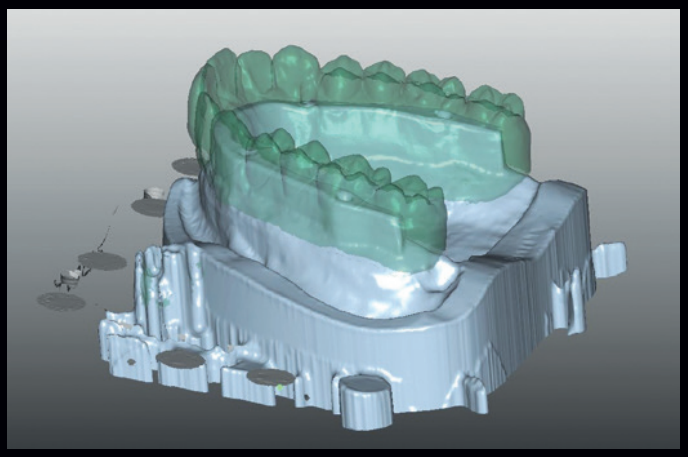
How much energy is buffered within the material? Alloys with high gold content show the highest grade of damping, and ceramics the lowest, followed by bovine enamel; composite materials lie in the middle.
We know that energy does not disappear without a trace within a closed system. It is transformed into another form of energy. This process is called dissipation in a dynamic system.
It is precisely this realisation which makes us aware of the predicament we are in when it comes to denture materials.

Consideration of the indications from Ambarino high-class from the company Creamed

AMBARINO High-Class is a radiopaque, ultra hard composite material with a high-density filler technology optimised on a ceramic base. The innovative material is available as a blank and in the form of blocks for detailed milling and grinding in CAD/CAM technology. The polychrome, multilayer blanks with dispersive colour gradient for veneer-free, ready-to-wear prostheses from the machine are of great interest for the highly aesthetic area, including for the adhesive veneer technique.

Using the example of the following, partly removable implant-supported construction, we show the manufacture of AMBARINO High-Class over a super structure to provide additional support for a full arch case.

A variety of materials can be used for the superstructure, depending on the strength and other characteristics desired. Superstructures have long been traditionally manufactured out of metals such as titanium or chrome cobalt, or they have been formed or milled from any number of commercially available fibrous, ceramic, resin or hybrid materials designed for dental applications. The various materials chosen for the superstructure have different comparative strengths, such as connectivity to implant interfaces, long term wear characteristics, integration, biocompatibility, density, toughness, loading capacity, corrosion resistance, bonding methods, aesthetics, flexibility, fracture resistance, and material adhesion.



In the digital view of the case presentation above, AMBARINO High-Class was designed in CAD CAM as an anatomical aesthetic full arch tooth structure and milled to fit precisely over a carrier bar superstructure using a backward-planning split file process. The AMBARINO High-Class material was then adhesively bonded to the bar with classic adhesive materials.

A variety of modern dental metal and metal-free formed or milled bar materials can be used as the understructure to better support a full arch restoration and interface directly or indirectly to the implants.

The complete, monolithic anatomical structure made out of AMBARINO High-Class is milled out of the polychrome multilayer blank with dispersive colour gradient, which is then adhesively bonded to the bar to form a stable multi-layer sandwich.

The construction is then finalized with a flowable gingiva composite over the AMBARINO High-Class material that can be further characterized to precisely match the patient's gums.

This study, about the evaluation of the damping behaviours of different dental materials with a new approach, is not dry, uninteresting science, if you consider the hard-earned knowledge in the context of their practical relevance. The closer we get to the natural, bionic conditions, the more practical it will become.
Elastic modulus is worshipped like a God, even though the tissues and structures in the oral cavity, like other materials and tissues in living nature, only have low levels of elastic modulus themselves. The aesthetics should also be considered and, even if you cannot always see them,

they should not age and remain shiny. Ceramics seem to be the material of choice. To counter the oft-cited chipping (there are also other reasons), monolithic constructions are increasingly being manufactured. If these works carried out with implants are to be sufficiently stable AND the colour of teeth, the material of choice, more and more, is zirconium dioxide.
Behaviour that is identical to nature, adaption, resilience and even antifragility appear to be unimportant. A high level of competence with regard to the occlusal concept in CAD is essential in order to avoid parafunctions and interference fields, which in turn can have negative effects on the natural tissue structures. And if a patient is considered to put their dentures at risk, and apparently there are many of those, then they can wear an ankle tag called a splint — at least at night. They can use that to safely let out their parafunctions, so that material and tissues are not damaged, since there is no adaption and damping by the denture material. Is that the solution? It is reminiscent of chair protectors made of transparent plastic, intended to protect the expensive cover. Comfort looks different.

Here it could be and is possible to pursue alternative methods with hybrid ceramics / highly-filled composites, where damping and adaption are present, along with sufficient, tooth-coloured aesthetics.

But, dear patient, a material that dampens, cushions, and compensates can unfortunately not also exist in its original form forever. Because, if such a material is deployed, used, and worn out, then its original form will inevitably change. Every patient will recognise this if they think of their natural teeth. It is simply a physiological process. The study has shown that there are alternative, tried and tested options for tooth-coloured dental materials in the form of modern, highly-filled hybrid ceramics/composites, which show an asymptotic approximation to the performance of natural teeth with regard to damping. With all advantages and all specific properties.
Obviously the abrasive properties of these materials and their hygiene potential must also be taken into account. In connection with fibre-filled CAD/CAM materials, interesting, high-strength sandwich hybrid constructions can be produced which, in the sum of their properties, have very good damping behaviour combined with sufficient mechanical strength, reliable long-term stability and good hygienic properties.

This is particularly interesting for implant-supported dentures.

1 Case Studies

AMBARINO® ***High Class***

ideal for full arch implant dentures

2 Case Studies

AMBARINO® ***High Class***

strength and aesthetics ideal for dentures

3 Case Studies

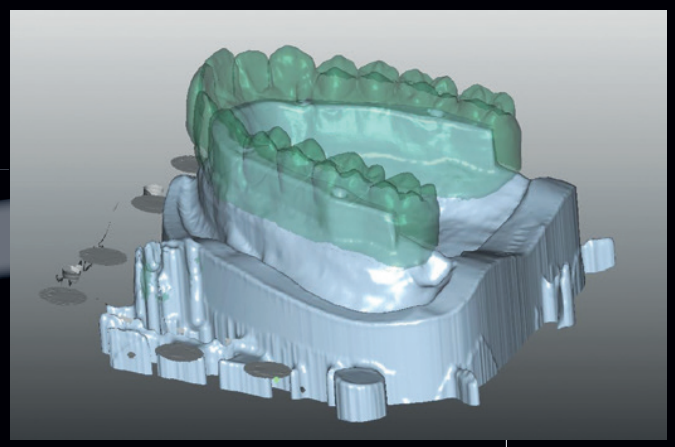
AMBARINO® ***High Class***

all-on-x with custom or standard abutments

4 Case Studies

AMBARINO® ***High Class***

combines with metal or metal-free understructures



polished only

5 Case Studies

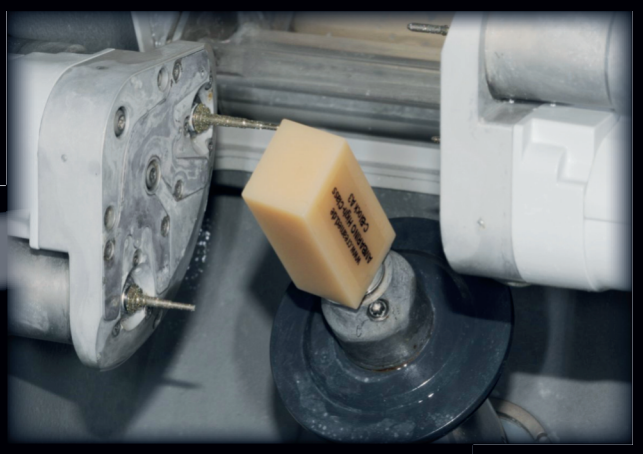
AMBARINO® ***High Class***

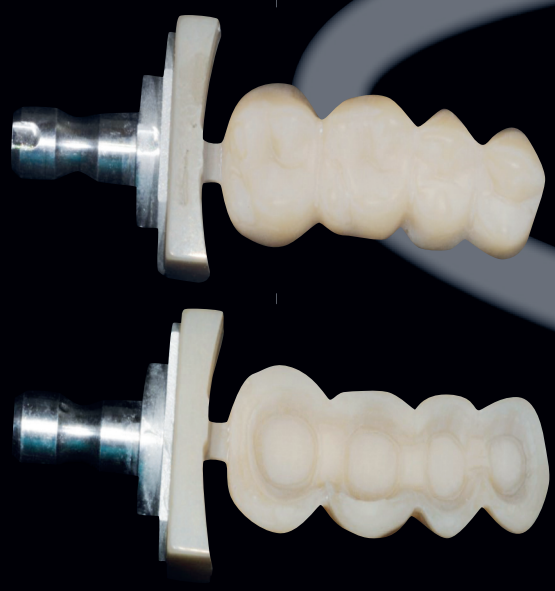
bonded with milled or anodized metal aesthetic

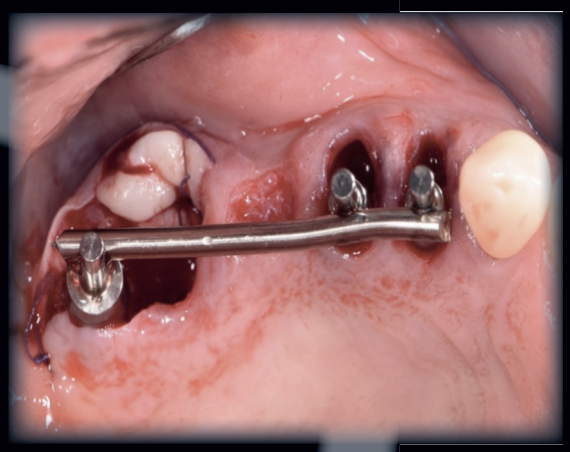
6 Case Studies

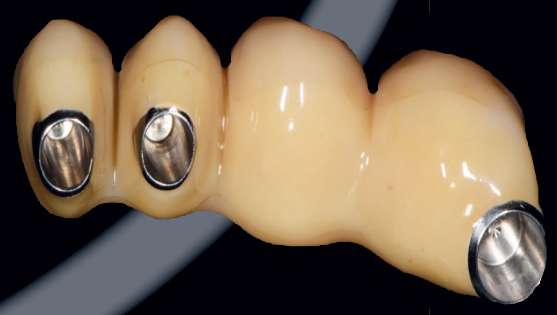
AMBARINO® *High Class*

chairside blocks, up to four unit bridges





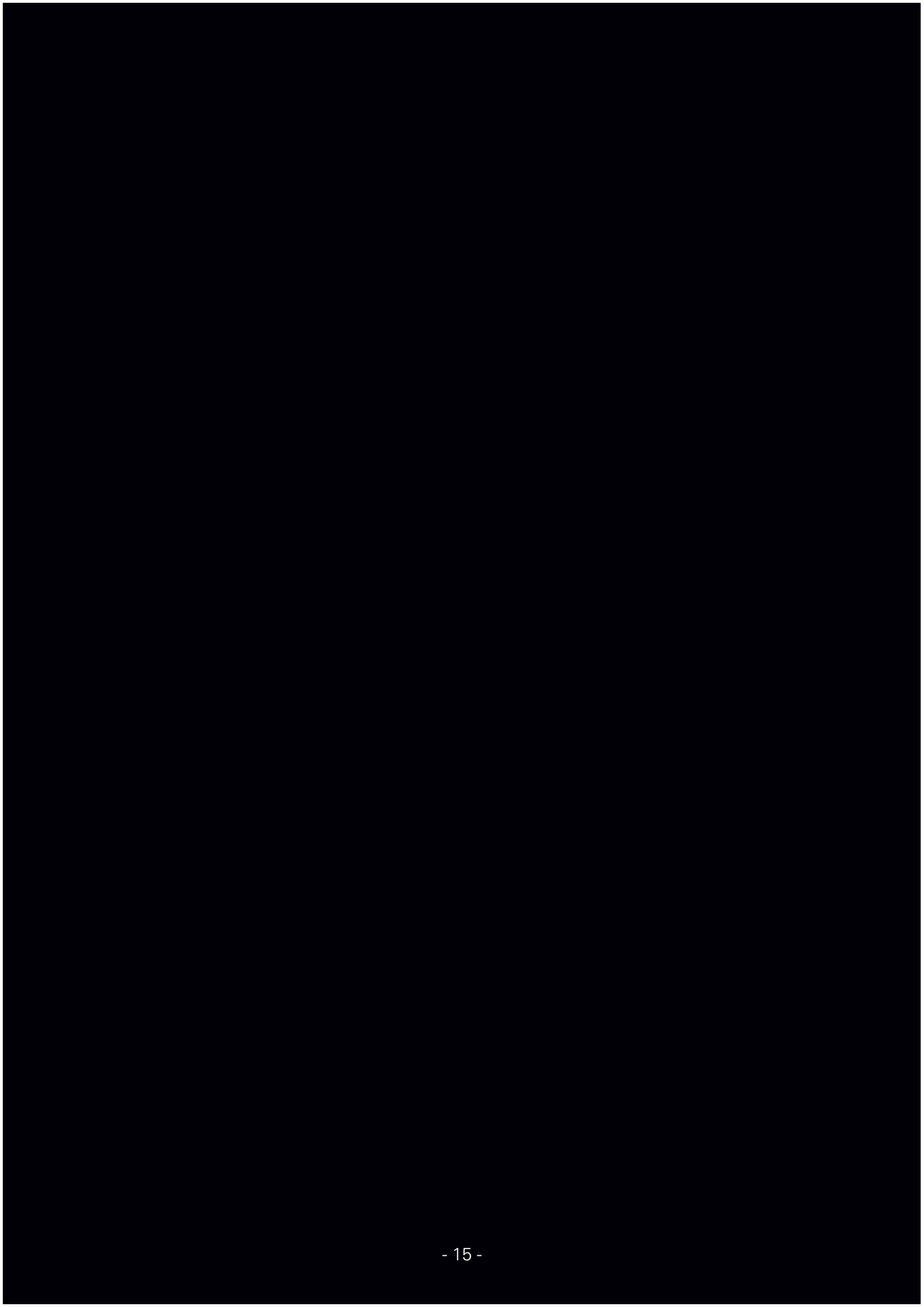




AMBARINO® ***High Class*** – Ordering Information

REF	ITEM DESCRIPTION - DISCS
900100	AMBARINO High Class Disc 15 mm A3
900104	AMBARINO High Class Disc 20 mm A3
900105	AMBARINO High Class Disc 10 mm A3
900106	AMBARINO High Class Disc 15 mm A3-MC
900107	AMBARINO High Class Disc 20 mm A3-MC
900200	AMBARINO High Class Disc 15 mm A2
900204	AMBARINO High Class Disc 20 mm A2
900205	AMBARINO High Class Disc 10 mm A2
900206	AMBARINO High Class Disc 15 mm A2-MC
900207	AMBARINO High Class Disc 20 mm A2-MC
900300	AMBARINO High Class Disc 15 mm B1
900304	AMBARINO High Class Disc 20 mm B1
900305	AMBARINO High Class Disc 10 mm B1
900306	AMBARINO High Class Disc 15 mm B1-MC
900307	AMBARINO High Class Disc 20 mm B1-MC
902100	AMBARINO High Class Disc 15 mm A1
902102	AMBARINO High Class Disc 20 mm A1
902105	AMBARINO High Class Disc 10 mm A1
902106	AMBARINO High Class Disc 15 mm A1-MC
902107	AMBARINO High Class Disc 20 mm A1-MC
902200	AMBARINO High Class Disc 15 mm C2
902202	AMBARINO High Class Disc 20 mm C2
902205	AMBARINO High Class Disc 10 mm C2
902300	AMBARINO High Class Disc 15 mm D2
902302	AMBARINO High Class Disc 20 mm D2
902305	AMBARINO High Class Disc 10 mm D2
901215	AMBARINO High Class Disc Veneer 15 mm Bleach 2
901220	AMBARINO High Class Disc Veneer 20 mm Bleach 2
901221	AMBARINO High Class Disc Veneer 10 mm Bleach 2
901222	AMBARINO High Class Disc Veneer 15 mm Bleach 2-MC
901223	AMBARINO High Class Disc Veneer 20 mm Bleach 2-MC
902400	AMBARINO High Class Disc 15 mm A3.5
902404	AMBARINO High Class Disc 20 mm A3.5
902405	AMBARINO High Class Disc 10 mm A3.5
902406	AMBARINO High Class Disc 15 mm A3.5-MC
902407	AMBARINO High Class Disc 20 mm A3.5-MC

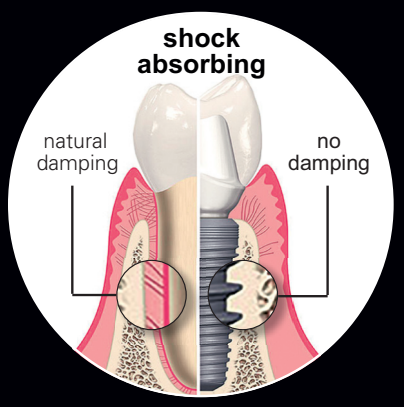
REF	ITEM DESCRIPTION - BLOCKS
900811	AMBARINO High Class C-Block B40 A3
900812	AMBARINO High Class C-Block B40 A2
900813	AMBARINO High Class C-Block B40 B1
900814	AMBARINO High Class C-Block B40 A1
900815	AMBARINO High Class C-Block B40 C2
900816	AMBARINO High Class C-Block B40 D2
900817	AMBARINO High Class C-Block B40 A3.5
901302	AMBARINO High Class C-Block Veneer B40 Bleach 2
900911	AMBARINO High Class C-Block AHC14 A3
900912	AMBARINO High Class C-Block AHC14 A2
900913	AMBARINO High Class C-Block AHC14 B1
900914	AMBARINO High Class C-Block AHC14 A1
900915	AMBARINO High Class C-Block AHC14 C2
900916	AMBARINO High Class C-Block AHC14 D2
900921	AMBARINO High-Class C-Block AHC14 A3.5
901402	AMBARINO High Class C-Block AHC14 Veneer Bleach 2



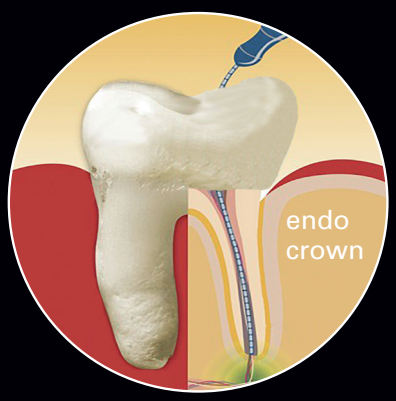
AMBARINO® ***High Class*** – Hybrid Glass Ceramic

functionality and aesthetics that inspire

why AMBARINO® *High Class?*



more than 30,000
successful cases
in 15 years



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